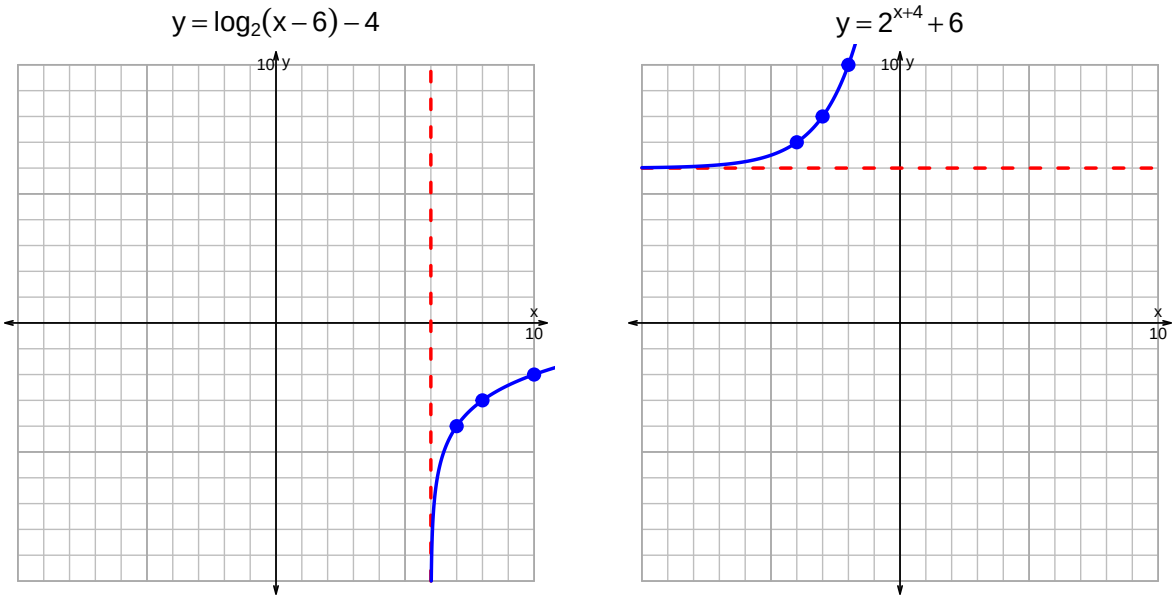
Name: Date:

s18quiz: EXP LOG (Solution v138)

1. Graph $y = \log_2(x-6) - 4$ and $y = 2^{x+4} + 6$ on the grids below. Also, draw any asymptotes with dotted lines.



2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-23 = \left(\frac{-3}{7}\right) \cdot 10^{5t/4}$$

Divide both sides by $\frac{-3}{7}$.

$$\frac{23 \cdot 7}{3} = 10^{5t/4}$$

Take log, base 10, of both sides.

$$\log_{10}\left(\frac{23 \cdot 7}{3}\right) = \frac{5t}{4}$$

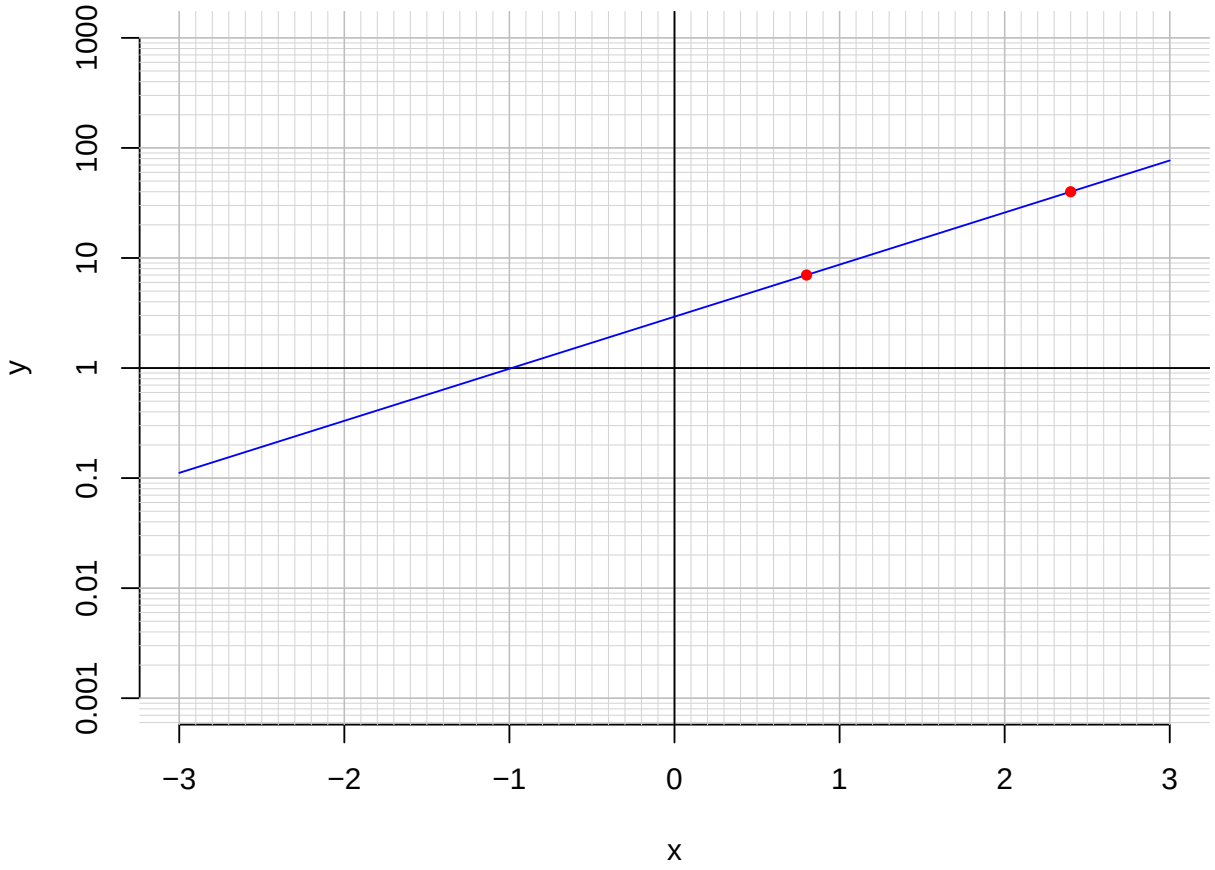
Divide both sides by $\frac{5}{4}$.

$$\frac{4}{5} \cdot \log_{10}\left(\frac{23 \cdot 7}{3}\right) = t$$

Switch sides.

$$t = \frac{4}{5} \cdot \log_{10}\left(\frac{23 \cdot 7}{3}\right)$$

3. An exponential function $f(x) = 2.93 \cdot e^{1.09x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(2.4)$.

$$f(2.4) = 40$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{1}{1.09} \cdot \ln\left(\frac{x}{2.93}\right)$$

c. Using the plot above, evaluate $f^{-1}(7)$.

$$f^{-1}(7) = 0.8$$